



Suborbital Flight Environment Monitor (SFEM)

001-PS

Problem Statement

- sRLVs are a new platform being utilized to advance the TRLs of new, emerging technologies of interest to NASA. There is very little information on the flight environment profile, especially within the payload container.
- This flight opportunity will demonstrate the efficacy of the SFEM to characterize the payload container, and provide environmental data of interest to researchers.
- All presently conceivable sRLV technology demonstrations will require knowledge of the actual flight environment as a function of time during the flight.

Technology

Development Team

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Proposed Flight Experiment

Experiment Readiness:

- The payload's validation testing has been completed and is ready for flight.

Test Vehicles:

- The SFEM would benefit by collecting data on all Flight Opportunities' vehicles - parabolic aircraft, sRLV's and/or high-altitude balloons. The greatest benefit would come from the information collected on the sRLVs and balloons.

Test Environment:

- The SFEM has flown on a parabolic flight, and requests opportunities on balloons and multiple sRLV flights from the various flight providers.

Test Apparatus Description:

- The Suborbital Flight Environment Monitor (SFEM) is a compact, self-contained payload that will monitor and record on-board environmental parameters of interest during a sRLV flight. These include 3-axis accelerations and G-loads, ambient pressure, relative humidity and temperature. The SFEM uses commercially available instruments. The SFEM is completely autonomous and doesn't require any operator interface during flight.



Technology Maturation

- The SFEM may be characterized as TRL 8 and requires a sRLV flight to a minimum of 100 km to reach TRL 9 for this application.
- Flight data needs to be recorded, downloaded and evaluated for instrument performance during launch, near space and reentry conditions.
- The SFEM should reach a TRL 9 prior to FOP flights requiring payload container environmental data.

Objective of Proposed Experiment

- Define the sRLV payload integration process.
- Record launch and flight environmental data.
- Characterize the payload environment for future NASA sponsored payload applications and the next generation SFEM.

The SFEM does not directly address any technology roadmap area, but indirectly addresses all of them by providing technologists with critical environmental data from their flights to assist in the assessment of their flight data.